

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following remarks and discussion is respectfully requested.

Claims 16-20 are pending in this application. By this amendment, Claims 11-15 are canceled, and Claims 16-20 are added. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action, Claim 15 was rejected under 35 U.S.C. § 112, second paragraph for being indefinite; Claims 11, 12 and 15 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,192,827 to Welch in view of JP 11-037315 to Osaka; Claim 13 was rejected under 35 U.S.C. § 103(a) as unpatentable over Welch, Osaka and further in view of U.S. Patent No. 5,242,538 to Hamrah; and Claim 14 was rejected under 35 U.S.C. § 103(a) as unpatentable over Welch, Osaka, and further in view of U.S. Patent No. 5,788,799 to Steger.

With respect to the rejection of Claim 15 under 35 U.S.C. § 112, second paragraph, Claim 15 is cancelled by the present amendment and now Claim 20 recites similar features and corrects the antecedent basis issue. Withdrawal of the rejection under 35 U.S.C. § 112, second paragraph is respectfully requested.

With respect to the rejection of the claims under 35 U.S.C. § 103, those rejections are respectfully traversed. Applicants submit that the applied art does not teach or suggest a deposit shield arranged in a vacuum processing chamber, the deposit shield including a notch portion formed to face a loading gate for the substrate, a shutter formed to match the notch portion so that the inner surface of the shutter and the curved side surface of the deposit shield make a same curved surface, as recited in Claim 16.

Instead, Welch discusses in column 7, lines 22 to 38 and Fig. 10, that the gap dimensions 88 and 90 are formed so as to inhibit generated plasma from moving into the

trans passage. As can be clearly seen in FIG. 10, a passage door 60 and upper and lower chamber liner portions 94 and 96 do not touch each other in order to prevent generation of particles that results from the contact between these members. Further, a large gap exists between the liner inner wall portions 94 and 96 and the door 60, as shown in Fig. 10. As such, Welch does not teach or suggest a shutter formed to match the notch portion such that the inner surface of the shutter and the curved side surface of the deposit shield make a same curved surface.

The deposit shield of one or more examples of the present invention has such a structure that the entire body thereof is housed in the chamber (see Fig. 6) and thus at least the side wall surfaces thereof on the chamber side are covered. According to an example, Fig. 5 of the present invention shows the side surfaces and top surface being covered, and Fig. 7 shows an example in which the side wall surfaces are covered. When the shutter is closed to abut against the notch portion of the deposit shield shown in Fig. 7, no irregularity is made in the inner wall surface of the deposit shield, creating one smooth plane, see Fig. 8B. A function of the deposit shield is to inhibit the irregularity on the surface to be exposed to plasma, and thus the density of plasma is made uniform.

In one or more examples of the invention, the entire body of the deposit shield is housed in the chamber, and with this structure, the shutter does not have a function of maintaining vacuum. The O-ring provided for the shutter is designed to prevent dust, for example, metal particles generated from the spiral ring from entering the apparatus. Therefore, in the example shown in Fig. 9, the O-ring may be omitted. In the example shown in Fig. 9, the section where the main body of the deposit shield and the shutter abut against each other is formed into an L-shape so as to prevent the entering of dust.

As described above, one or more embodiments of the present invention do not employ such a structure that the vacuum is maintained to load or unload an object to be processed,

unlike a gate provided for a vacuum processing chamber as in the applied art. Thus, the shutter of the deposit shield of one or more embodiments of the present invention and the gate provided for a processing chamber are members entirely different from each other.

Welch, further describes that there is a difference in pressure created between the front and back sides of the passage door 60 one of which is in contact with a vacuum state of the vacuum chamber. Osaka discloses a gate valve in which a valve element 32 having a tapered surface on which a sealant 32 is mounted, in tight contact with a valve seat 28, as shown in FIG. 2(B) and has a function of maintaining a vacuum of the vacuum chamber. By contrast, the shutter of the claimed invention is not provided inside the processing chamber, and therefore there is no difference in pressure created between the front and back surfaces (inner surface and outer surface) of the shutter.

In Welch, there is a difference in level between the inner surface of the vacuum chamber 34 and the surface of the passage door 60 as shown in Fig. 5. With this level difference, it is not possible to make the plasma density uniform. The above-described drawback is mentioned in the present specification as an object to be solved. An object of one or more examples of the present invention is to provide a deposit shield devised to prevent irregularities in the surface exposed to plasma. As discussed above, the advantages provided by the features of the claimed invention cannot be achieved by Welch or Osaka either alone or in combination.

The spiral seal as recited in Claim 16 functions as an elastic member used when the shutter is opened or closed. As such, the involved members are connected to each other in an electrically uniform fashion to inhibit the leakage of plasma. Moreover, an O-ring as set forth in the claimed invention is provided on an inner side (the vacuum processing chamber side as shown in Fig. 8A) by means of the spiral seal. This structure prevents metal particles generated from the spiral seal from dispersing to the processing area. The above-described

advantageous effect of the present invention cannot be obtained even if the applied art is combined together.

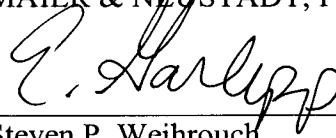
For at least the reasons discussed above, withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) is respectfully submitted.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



Steven P. Weihrouck  
Attorney of Record  
Registration No. 32,829

Kevin M. McKinley  
Registration No. 43,794

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

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**Edwin D. Garlepp**  
**Registration No. 45,330**